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CONTRIBUTIONS FROM THE ROCKY MOUNTAIN HERBARIUM. VI.

AVEN NELSON.

SPHAEROSTIGMA F. & M., Ind. Sem. Hort. Petrop. 2:49. 1835.

Since Dr. JOHN K. SMALL published "Oenothera and its segregates,"¹ much material has been accumulating illustrative of the various species and tending to confirm the wisdom of the earlier generic limitations which were again revived in that paper. In this group of genera, the species of which seem particularly susceptible to differences in environment, we may expect great variation, and therefore naturally differences of opinion as to specific limitations. This has resulted in a rather extended synonymy, which makes studies in the group more than ordinarily difficult. It is not the purpose of the writer to review these genera, but simply to put on record a study of the species of *Sphaerostigma*, made necessary by the attempt to name some material that came into his hands for examination. This study, in order that it might be the more complete, was extended to the collection of the Missouri Botanical Garden.² While listing all the species, there is no necessity for attempting a complete synonymy. SMALL's paper, cited above, will furnish references to all the important literature on this genus, except that of LÉVEILLÉ.³ I give therefore only the first use of the present

¹ Bull. Torr. Bot. Club 23:167. 1896.

² Acknowledgment is here made of the uniform courtesy and kindness of the Director, Dr. WILLIAM TRELEASE, in permitting the examination of these valuable specimens—some 200 sheets.

³ "Monographie du Genre *Oenothera*." I will not attempt to review this very elaborate paper, but since LÉVEILLÉ's notions of generic limitations are so completely out of harmony with the now accepted ideas of American botanists, it may be permissible to relist the species of the American genus *Sphaerostigma*. The specimens of *Sphaerostigma* in the Mo. Bot. Garden Herb. were examined by him and bear his annotations. It is extremely difficult to believe that his grouping of the specimens can stand, especially when one finds that the annotations do not harmonize with the final published list, and that the nomenclature of the illustrations in some instances does not coincide with that of the text.

combination and a reference to what seems to be the first publication of the species or variety.

KEY TO THE SPECIES.⁴

Flowers yellow, sometimes turning red or green.

Capsules straight.

- Fusiform..... 1. *S. andinum*.
 1a. *S. andinum* Hilgardi.
 1b. *S. andinum* minutum.

Narrowly linear..... 2. *S. filiforme*.

Capsule more or less curved or contorted.

Narrowly linear, cylindrical or nearly so.

Curved but not contorted.

Ascending.

Flowers minute.

Capsule short (less than 2^{cm})... 3. *S. Nelsonii*.

Capsule long (more than 2^{cm})... 4. *S. chamaenerioides*.

Flowers 1^{cm} or more in diameter.. 5. *S. campestre*.

5a. *S. campestre* helianthemiflorum.

5b. *S. campestre* minus.

5c. *S. campestre* mixtum.

Refracted..... 6. *S. refractum*.

More or less contorted..... 7. *S. contortum*.

7a. *S. contortum* flexuosum.

7b. *S. contortum* pubens.

7c. *S. contortum* Greenei.

Broadly linear, more or less 4-angled.

Whole plant glabrous..... 8. *S. nitidum*.

Plant not wholly glabrous.

Flowers small (1^{cm} or less broad).

Stems virgate, fructiferous to the base.

Stem leaves ovate-triangular... 9. *S. arenicolum*.

Stem leaves oblong-lanceolate... 10. *S. hirtellum*.

Stems branched from the base... 11. *S. micranthum*.

11a. *S. micranthum* Jonesi.

11b. *S. micranthum* exfoliatum.

Flowers large (more than 1^{cm} broad).

Leaves canescently pubescent.

Narrowly oblong or oblance-

olate..... 12. *S. bistortum*.

12a. *S. bistortum* Veitchianum.

⁴ The following species are not included in this table: *S. angelorum* (Wats.), *S. pterospermum* (Wats.), *S. rutilum* (Davids.).

- Ovate to orbicular.....13. *S. spirale*.
 13a. *S. spirale viridescens*.
 13b. *S. spirale clypeatum*.
- Flowers white or rose color.
- Leaves glabrous or nearly so.
- Bark of stem shining and shreddy.....14. *S. decorticans*.
- Bark of stem green.
- Capsules evenly distributed.....15. *S. tortum*.
 15a. *S. tortum Eastwoodae*.
- Capsules interruptedly crowded.....16. *S. tortuosum*.
- Leaves not glabrous.
- Villous or tomentose.....17. *S. utahense*.
- More or less pubescent but not tomentose.
- Capsules enlarged at base.
- Bark glabrous and shreddy.....18. *S. Boothii*.
- Bark hirsute, not shreddy.....19. *S. Lemmoni*.
- Capsule not noticeably enlarged at base.
- Branches paniculately branched
 above.....20. *S. Hitchcockii*.
- Branches simple above.....21. *S. alyssoides*.
 21a. *S. alyssoides macrophyllum*.

1. *S. ANDINUM* (Nutt.) Walp. Repert. 2:79; *Oenothera andina* Nutt., T. & G. Fl. N. A. 1:512.—Not often collected but no doubt of frequent occurrence from western Wyoming westward and northward to Nevada and Washington, where it passes into

1a. *S. ANDINUM Hilgardi* (Greene), n. comb.; *Oenothera Hilgardi* Greene, Bull. Torr. Bot. Club 10:42.—There is no possibility of maintaining this as a distinct species. No differences except a slightly greener hue and somewhat greater size in all of its parts is perceptible. These differences may well be due to the more vigorous growth induced by the greater moisture and higher temperature in the range of the variety.

1b. *S. ANDINUM minutum*, n. var.—A very diminutive form related to *S. andinum*, with minute flowers, obovate petals, very unequal stamens (the one set almost rudimentary), calyx tube nearly wanting, and the capsule somewhat clavate, tapering to a short pedicel.

The type of this variety is in herb. Mo. Bot. Gard., without data. With the specimens are pencil drawings, showing the above characters, made by Dr. GEO. ENGELMANN, and bearing the herbarium name *Oenothera minuta*. Possibly future collections may show this worthy of specific rank.

2. **S. filiforme**, n. sp.—A diminutive annual 3–5^{cm} high, with filiform stem drooping at summit, and the filiform leaves and capsules more or less secund; ciliate-pubescent throughout; the diminutive flowers yellow; tube of calyx wanting; capsules erect, straight, pubescent, filiform, 1–2^{cm} long.

Type in herb. Mo. Bot. Gard. from New River (Reese's River), Utah, May 28, 1889. Collector not known.

3. **S. NELSONII** Heller, Muhl. 1:1; *S. minor* A. Nels., Bull. Torr. Bot. Club 29:130.—Though Léveillé has seen fit to reduce this, a re-examination of the material at hand simply increases my belief in its validity.

4. **S. CHAMAENERIODES** (Gray) Small, Bull. Torr. Bot. Club 23:189; *Oenothera chamaenerioides* Gray, Pl. Wright 2:58.—This is a strongly marked species that seems never to be confused with any other.

5. **S. CAMPESTRE** (Greene) Small, Bull. Torr. Bot. Club 23:189; *Oenothera dentata* Wats., Bot. Cal. 1:216.—Variable as to the curvature of the capsule, which is often greatly flexed. The large-flowered form is most frequently collected and may be known as follows.

5a. **S. CAMPESTRE helianthemiflorum** (Lévl.), n. comb.—This is the form of the species which is often distributed as *Oenothera dentata grandiflora* Wats. See plate in Lévl. Monog. opposite 178.

5b. **S. CAMPESTRE MINUS** Small, Bull. Torr. Bot. Club 23:189; *Oenothera dentata cruciata* Wats., Proc. Am. Acad. 8:594.—Often distinguishable from the species with difficulty. Its stricter habit, smaller flowers, and more glabrate stems are characters usually mentioned.

5c. **S. CAMPESTRE mixtum** (Lévl.), n. comb.—Two specimens in herb. Mo. Bot. Gard. have been designated as forms *mixta* and *permixta* by Léveillé, Monog. 180. There seems to be no difference between them except the smaller flowers of the former. Since the former is a much older plant, it may happen that the later blossoms are small. Believing them to be the same, they are here given varietal rank. This variety may be known by the dark green, broadly linear leaves, which are dentate and very numerous, quite crowded and seemingly fascicled upon the short, spreading, or nearly prostrate branches.

6. *S. REFRACTUM* Wats., Proc. Am. Acad. **17**:373.—Quite distinct, and well-developed specimens are readily recognized.

7. *S. CONTORTUM* (Dougl.) Walp., Repert. **2**:78; *Oenothera contorta* Dougl., Lehm. in Hook. Fl. Bor. Am. **1**:214.—Why LÉVILLÉ rejects this and a succession of available names, which he cites as synonyms, does not appear in his monograph. He figures a variety of *O. bistorta* (*O. cheiranthifolia*) as *contorta* Dougl., but even if he were right in thus referring the name given by DOUGLAS, there are yet several other available names. It still remains to be proven, however, that *S. contortum* is not a valid name for *Oenothera strigulosa* T. & G. Fl. **1**:512.

7a. *S. CONTORTUM flexuosum*, n. var.—Small, about 1^{dm} high; branches few, divaricate ascending, usually a pair near the base: leaves linear: flowers yellow; calyx tube obconic: capsule cylindrical, sessile, linear, 2–3^{cm} long, variously curved, usually deflexed and again upturned, producing S-shaped forms: seeds smooth.

This was distributed some years since under the herbarium name *S. flexuosum*. No. 4060, named as the type, was secured at Point of Rocks, June 16, 1898. Other specimens are: Nelson, 4698, Granger, Wyo.; Jones, Deep Creek, Utah, June 22, 1891; Genoa (?), Carson Valley, June 17, 1889; Merrill and Wilcox, 602, Pacific Creek, Wyo.

7b. *S. CONTORTUM PUBENS* (Wats.) Small, Bull. Torr. Bot. Club **23**:189; *Oenothera strigulosa pubens* Wats., Proc. Am. Acad. **8**:594.—Very diverse forms are distributed under this name. The variety probably shades into the species by imperceptible degrees.

7c. *S. CONTORTUM GREENEI* Small, Bull. Torr. Bot. Club **23**:189; *Oenothera strigulosa epilobioides* Greene, Fl. Francis. 216.—No specimens have been seen by me.

8. *S. NITIDUM* (Greene) Small, Bull. Torr. Bot. Club **23**:190; *Oenothera nitida* Greene, Pitt. **1**:70.—Perfectly distinct and not to be confused with any other unless it be with *S. spirale*, the canescence of which serves at once to separate them.

9. *S. arenicolum*, n. sp.—Annual, with one main virgate erect stem and 2–4 slender simple ascending-erect branches from near the base; the purplish stem and branches sparsely ciliate-pubescent: leaves crowded, triangular-ovate or narrower, sessile and somewhat clasping by a subcordate base, 1–2^{cm} long; root-leaves longer,

oblanceolate and tapering into a slender petiole; all of them hirsute with white spreading hairs: flowers axillary from the base up; calyx tube very short, the lobes lance-oblong, 3-4^{mm} long; petals broadly ovate-oblong, tridentate at the nearly truncate summit, about twice as long as the calyx-lobes, exceeding the longer stamens and about equalled by the pistil: capsules purplish, small and slender, less than 2^{cm} long, variously flexed and somewhat angled: seeds small, pale, smooth, usually oblique at base and obliquely pointed at apex.

I name as type A. D. E. Elmer's no. 3192, Monterey, Cal., distributed as *S. micranthum*. No. 5099, by C. A. Purpus, seems to be the same.

10. *S. HIRTELLUM* (Greene) Small, Bull. Torr. Bot. Club **23**:190; *Oenothera hirtella* Greene, Fl. Francis. 215.—LÉVEILLÉ in his monograph reduces this to a form of *S. micranthum*, but this does not seem to be justified by his specimens.

11. *S. MICRANTHUM* (Hornem.) Walp. Repert. **2**:77; *Oenothera micrantha* Hornem. Hort. Hafn.—That LÉVEILLÉ should take up the much later name *O. hirta*, and then reduce to this species such distinct forms as *S. hirtellum*, and *S. Nelsonii*, seems a little strange. However, he has described a very good variety which may be written

11a. *S. MICRANTHUM Jonesi* (Lévl.), n. comb.—Taking as the type the first number cited, viz. Hansen's 543, Amador Co., Cal. 1892, I would name as a close duplicate C. C. Parry's specimens (in the Missouri Botanical Garden) simply labelled "*Oenothera*. June 1889. Cal." Blanche Trask's Avalon specimen, cited by LÉVEILLÉ, seems rather to belong with the species itself. It is quite probable that the species as it now stands is an aggregate.

11b. *S. MICRANTHUM exfoliatum*, n. var.—Branched from the base, the stems stoutish, the bark white, shreddy, and exfoliating in thin sheets, giving the plant the appearance of *S. decorticans*: pubescence of the stems ciliate, that of the leaves and fruits closer and somewhat appressed: capsules sharply angled, contorted.

I cite here the following specimens: C. R. Orcutt, Colorado Desert, April, 1889; C. A. Purpus, no. 5083, Erskine Creek, Cal., 1897.

12. *S. BISTORTUM* (Nutt.) Walp., Repert. **2**:77. *Oenothera bistorta* Nutt., T. & G. Fl. N. A. **1**:508.

12a. *S. BISTORTUM Veitchianum* (Hook.), n. comb.; *Oenothera bistorta Veitchiana* Hook., Bot. Mag. *pl.* 5078.—The characters

which were supposed to distinguish this variety sufficiently from *S. bistorta* and to constitute it a species become less well-defined the larger the series of specimens. Even the greater length of capsule and beak seems to be a variable quantity.

13. *S. SPIRALE* (Lehm.) Fish. & Mey., Ind. Sem. Hort. Petrop. 2:50; *Oenothera spirale* Lehm. in Hook. Fl. Bor. Am. 1:213.—Assuming it to be a fact that this Californian plant is distinct from *S. cheiranthifolium* of South America, the specific name as given by LEHMAN in Hooker's *Flora* is the next available one.

13a. *S. SPIRALE viridescens* (Lehm.), n. comb.; *Oenothera viridescens* Lehm. in Hook. Fl. Bor. Am. 1:214.—If this be a good species, it certainly is very difficult to distinguish from the preceding. It was given only varietal rank by WATSON in his revision (Proc. Am. Acad. 8:592), under the name *suffrutescens*—the woody base and possibly perennial duration, with the somewhat larger flowers, being the characters that he used. But even in these respects the species and the variety seem to grade into one another.

13b. *S. SPIRALE clypeatum* (Lévl.), n. comb.; *Oenothera clypeata* Léveillé, Monog. *Oenothera*, 222.—Distinguishable by the broad, shield-shaped leaves which are densely canescent, and by the large flowers (often 4^{cm} across).

14. *S. DECORTICANS* (H. & A.) Small, Bull. Torr. Bot. Club 23:191; *Gaura decorticans* H. & A. Bot. Beech. Voy. 343.—SMALL seems to be well within bounds when he assigns priority to the name of HOOKER and ARNOT. The species, though apparently greatly variable, is so merely before it begins to blossom when quite small, at which time it is smooth and erect. With age it becomes large, more spreading, and roughened with the loosened shining shreddy bark. WATSON'S characterization of the seeds as "cellular-pubescent" is a good one.

15. *S. tortum* (Lévl.), n. sp.; *Oenothera chamaenerioides torta* Lévl., Monog. *Oenothera*, 230; *O. alyssoides minutiflora* Wats., Proc. Am. Acad. 8:591.—Branched from the base and spreading, becoming at length nearly prostrate; leaves glabrous, mostly basal, oblanceolate and tapering into slender petioles: capsules about 2^{cm} long, cinereous, variously contorted.

LÉVEILLÉ is right in allying this with *S. chamaenerioides*, but on habit alone, to say nothing of the fruits, it is entitled to specific rank.

Following are specimens illustrating: Jones, 5548, Manti, Utah; Nelson, 4691, Granger, Wyo.; Cusick, 2515, Malheur River, Oregon; Trelease, 4435, Shoshone, Idaho; Nelson, 4707, Green River, Wyo.; Godding, Milford, Utah.

15a. *S. TORTUM* **Eastwoodae**, n. var.—Leafy throughout, the leaves oblong-linear: flowers very small: capsule tapering into a slender beak, spirally coiled at base.

This is probably a good species. Only one specimen is before me: Alice Eastwood, Grand Junction, Colo., May, 1892.

16. *S. TORTUOSUM* A. Nels., Proc. Biolog. Soc. **17**:95. 1904; *Oenothera gauraeiflora caput-medusae* Lévl., Monog. *Oenothera*, 226. —LÉVEILLÉ's plate shows only a single branch from Lemmon's specimens.

17. *S. UTAHENSE* Small, Bull. Torr. Bot. Club **23**:191.—Whitened with a tomentose pubescence, branching from the base upward, 15^{cm} or more high (the plants in hand are all young): leaves ovate, obovate, or oblanceolate, 2–4^{cm} long, generally tapering to a short petiole: flowers crowded in terminal somewhat corymbose racemes, white; calyx-tube longer than the lanceolate lobes; petals obovate, 5^{mm} long, longer than the stamens but surpassed by the pistil: capsule linear, less than 2^{cm} long, more or less contorted.

The specimens before me were collected by L. N. Goodding at Milford, Utah. As the original description calls for yellow flowers I thought at first Goodding's specimens were another species, but agreeing in most other respects I am going to assume that "flowers yellow" was a clerical error.

18. *S. BOOTHII* (Dougl.) Small, Bull. Torr. Bot. Club **23**:191; *Oenothera Boothii* Dougl., Lehm. in Hook. Fl. Bot. Am. **1**:213.—Seemingly seldom collected. Typical specimens by L. F. Henderson, Shoshone Falls, Idaho, July, 1897. Many of the specimens referred to this species belong to the next.

19. *S. Lemmoni*, n. sp.—Branched from the base up, 2–3^{dm} high, stem and branches rather stout, crinkled-hirsute; branches divaricate-ascending: leaves rather large, variable in size, 2–5^{cm} long, oblong or broader, mostly acute at apex, lower tapering into petioles, hirsute-ciliate especially beneath: flowers in a crowded terminal short-hirsute raceme, lengthening into a bracteate fruiting spike; calyx tube but slightly enlarged upward, scarcely as long as its narrowly lanceolate lobes; petals broadly obvate or suborbicular,

about 7^{mm} long, slightly longer than the calyx lobes and stamens, equalling the style; stamens similar and equal; capsule slender, tapering to summit, ascending, somewhat bent or contorted, about 2^{cm} long.

This has passed as *S. Boothii* Dougl. Similar as the descriptions seem, the two plants are quite distinct in appearance. *S. Boothii* is glabrous and with shreddy bark on the older stem; it branches mainly near the base, the branches also branching; its flowers are much smaller, and the capsules are shorter and more contorted.

The type is J. G. Lemmon, no. 103, eastern flank of Sierra Nevada, Cal. 1875. Two good specimens, both in herb. Mo. Bot. Garden.

20. ***S. Hitchcockii*** (Lévl.), n. sp.; *Oenothera gauraeflora Hitchcockii* Lévl., Monog. *Oenothera*, 226.—Softly hirsute or ciliate, branched from the base, 15–25^{cm} high; branches slender and more or less paniculately branched above: root leaves oblong, irregularly dentate, about 3^{cm} long, tapering into a petiole one-half as long; stem leaves smaller, bract-like, sessile, broadly linear or lanceolate: flowers crowded in bracteate secund racemes; calyx tube slender, scarcely enlarged at summit, as long as the linear-lanceolate lobes; petals white, obovate, 3–4^{mm} long, scarcely longer than the calyx lobes and the stamens; style slender, longer than the petals: capsules slender, 12–18^{mm} long.

This very excellent species rests upon two specimens in herb. Mo. Bot. Garden. One bears the data "Simpson Park, July 6th, 1859 (?)," and in pencil "nothing like it known to me;" the other is blank, but both look as if they were from the same collection.

21. *S. ALYSSOIDES* (H. & A.) Walp., Repert. 2:78; *Oenothera alyssoides* H. & A., Bot. Beech. Voy. 340.

21a. *S. ALYSSOIDES MACROPHYLLUM* Small, Bull. Torr. Bot. Club 23:192; *Oenothera alyssoides villosa* Wats., Proc. Am. Acad. 8:591.

The following are, so far as the writer knows, still unknown except from the original specimens and descriptions. So far as one may judge from descriptions, they are valid and will no doubt again come to light.

S. ANGELORUM (Wats.), *Oenothera angelorum* Wats., Proc. Am. Acad. 24:49.

S. PTEROSPERMUM (Wats.); *Oenothera pterosperma* Wats., King's Rep. 112.

S. RUTILUM (Davids.); *Oenothera rutila* Davids., Erythea 2:61.

COOPER'S COLORADO COLLECTIONS.

In the summer of 1904, Mr. WILLIAM S. COOPER, a student in Alma College, Michigan, spent some weeks in Colorado collecting in the vicinity of Estes Park and upon Long's Peak. He secured over 300 numbers, many of them of great interest. The following I will characterize as new:

Oreocarya pulvinata, n. sp.—Cespitose-pulvinate, practically stemless, the small cushions a few centimeters across and about 1^{cm} high; flowers as well as the leaves involved in the soft villous pubescence: leaves crowded, broadly linear, less than 1^{cm} long: flowers few, glomerate at the summit of the reduced stems (the stems scarcely rise above the matted leaves): calyx-lobes linear, nearly equaling the corolla tube: corolla white; its tube dilated, subspherical, about 2^{mm} long, the broad throat only partly closed by the conspicuous crests; the lobes of the limb suborbicular, about as long as the tube: stamens small, included, inserted near the middle of the tube; filament almost wanting: style short, rather thick, equaling the stamens.

This species so closely simulates *Eritrichium aretioides* (before the flower stalks of that species have developed) that one would almost certainly pronounce it an *Eritrichium* at the first glance. The pubescence and pulvinate habit are similar, but a glance at the flowers does not leave one in doubt very long.

The type material, no. 278, is very scanty, but so characteristic a species cannot be ignored. Collected on Mummy Mts., Estes Park, Aug. 12, 1904, alt. 12-13,000^{ft}.

Chrysopsis Cooperi, n. sp.—Whitened with soft loose long-villous pubescence throughout: stems low, spreading, more or less decumbent at base, 10-15^{cm} high, leafy throughout: leaves narrowly oblanceolate, tapering into a margined petiole-like base, from 2-5^{cm} long, middle and upper stem leaves usually longer than the basal: heads solitary, terminal and axillary; terminal head large, 12-14^{mm} high and considerably broader, subtended by some foliar bracts which are long-ciliate on the margins; axillary heads reduced downward, on successively shorter leafy peduncles, usually only the 2 or 3 uppermost developing, the others becoming sessile and aborted

in the axils: involucre bracts narrowly linear, acute, midrib green and the margins scarious: rays 15-25, orange-yellow, ligule 12-15^{mm} long; disk corollas numerous, with very slender tube which is shorter than the narrowly tubular throat; teeth short, lanceolate, erect: pappus dingy, equaling the corolla: akene short-linear, minutely silky-pubescent.

This is probably to be compared with *C. alpicola* Rydb. and *C. Bakeri* Greene, but it is far more silky-hirsute than either. It seems to be unique in the axillary heads, which though usually aborted can be detected in the axils nearly down to the base of the stems.

Cooper's no. 50, Long's Peak, near timber line is the type; August 11, 1904.

CHRYSOPSIS ALPICOLA glomerata, n. var.—Closely resembling the species and like it nearly devoid of basal leaves at anthesis: heads several, closely glomerate at the summit of the simple stems.

Founded on Cooper's no. 174, Estes Park, August, 1904.

Aster Cordineri, n. sp.—Spreading by horizontal rootstocks, dark green and seemingly glabrous to the unaided eye, under a lens minutely but very sparsely scabrous (mostly on the margins of leaves and involucre bracts): stems 3-6^{dm} long, generally simple below, racemously short-branched above, decumbent at base and either widely spreading or nearly erect, often puberulent especially upward, very leafy: leaves broadly linear, crowded, spinulose tipped; primary ones 4-7^{cm} long, 4-6^{mm} broad; secondary ones similar but smaller, more or less fascicled in the axils: heads solitary at the ends of the short leafy axillary racemously disposed branchlets, rather large: involucre nearly 1^{cm} high, somewhat broader than high; bracts erect, glabrate, dark green on the spatulate-linear blade, lighter at base, spinulose tipped: rays 20-30, bluish shading to white: pappus rather coarse and dingy: akene short-pubescent.

A very characteristic species related to *A. commutatus*. Readily distinguished by its glabrate dark green appearance and the relatively few large solitary heads. The branchlets are strictly racemose, only 3-5^{cm} long, and those on the stems, which are widely spreading, are assurgent and therefore secund in appearance. Two collections are at hand. The first was secured at Myersville, Wyo., on the Sweetwater, Sept. 5, 1894, by Mr. George Cordiner, the writer's first enthusiastic field assistant;⁵ the second is Cooper's no. 151 (type) from Estes Park, Aug. 11, 1904.

⁵ Mr. Cordiner was accidentally killed in 1895 by a falling wall at a fire where he was assisting. I name this plant in memory of a young life of great promise.

Crepis alpicola (Rydb.), n. sp.—Caudex short, vertical, semifleshy: leaves glabrous, rosulate on the crown, linear-oblong or oblanceolate, acute at apex, sessile or tapering into a short margined base, entire or saliently toothed or even subruncinate, 3–6^{cm} long: stems scapose, simple, glabrous, with one or two linear bracts, 10–20^{cm} high, usually monocephalous: involucre about 14^{mm} high, dark green, clammy or glandular pubescent; its bracts in 3 or 4 successively shorter rows: ligules 2^{cm} long: akenes short, fusiform, shorter than the fine white pappus.

This is probably *C. runcinata alpicola* Rydb., Bull. Torr. Bot. Club 24: 299, although the above description does not quite tally with the brief diagnosis of the variety. A reasonable amount of variation will account for any differences. It is to be compared, however, with *C. riparia*, because of its large heads and the gland-tipped pubescence on the involucre. It is distinct from that species in its small glabrous leaves, its one-flowered stems, its involucre of 3 or 4 rows of bracts, and its short fusiform akenes. Cooper secured it in an alpine meadow (11,000^{ft}) on Long's Peak, Aug. 3, 1904, no. 218.

MISCELLANEOUS SPECIES.

Gilia exserta, n. sp.—Biennial, 2–3^{dm} high: stem single at base but branched from near the base upward; branches mostly simple and moderately divaricate, almost equaling the main stem, minutely pruinose-viscid: leaves 2–5^{cm} long, somewhat pungent, linear, entire or simply pinnatifid, with few to several linear lobes: flowers in small bracteate cymes forming narrow panicles: calyx membranous, narrowly campanulate, about 4^{mm} long, merely pruinose; its teeth very short, green, triangular-subulate, and minutely pungent: corolla white, purple dotted, 10–12^{mm} long, somewhat trumpet-shaped; tube surpassing the calyx; its lobes elliptic-oblong, acute, almost as long as the tube: stamens noticeably exserted; style scarcely so: ovules about 2 in each cell; seeds destitute of mucilage.

The type is no. 538, by C. F. Baker, Pagosa Springs, Colo., July 28, 1899. It was distributed on GREENE's determination as *G. multiflora* Nutt., which it certainly cannot be. It seems nearer *G. stenothyrsa* Gray of the section GIL-ANDRA (Syn. Fl.).

Amelanchier oreophila, n. sp.—A low scraggy-branched shrub, 1–2^m high, growing mostly in close clumps: young leaves, petioles, and twigs more or less lanate-pubescent, some of the pubescence persisting till maturity, especially on the lower face of the leaves:

leaves ovate, obovate, or broadly elliptic, rather small, not more than 3-4^{cm} long even at maturity, incisely small-toothed from the middle to the obtuse or rounded apex, on petioles usually less than half as long as the blade: racemes short and dense: calyx-lobes subulate-triangular, lanate-pubescent on the margins and inner face, the pubescence persisting nearly or quite till maturity: petals spatulately oblanceolate, short (about 8^{mm}): pome globose, purplish black, developing but little pulp, and remaining rather dry and insipid, maturing late (September ?).

This is a segregate from *A. alnifolia* Nutt. I think most collectors must have felt that either *A. alnifolia* was unusually variable or that some segregation ought to be made. After many years' observation in the field and the study of a large series of specimens, I am satisfied that two valid species exist and can be readily distinguished. Nuttall's *A. alnifolia* is the widely distributed glabrous shrub of the creek banks, moist cañons, and snow slopes. At maturity it is perfectly glabrous and is quite glabrous from the beginning upon the calyx lobes. The leaves are larger, coarsely serrate, often suborbicular or with a tendency to truncateness at base and apex. The petals are much larger (12-15^{mm} long). The fruits become much larger, are purple, with bloom, juicy and well flavored, are used extensively for sauce and pies, maturing during July or August according to the altitude.

A. oreophila is a smaller shrub, scraggy-branched, usually in dense clumps, and occurring in the driest situations (open stony slopes, ridges, and hilltops). It is never wholly glabrous, and the fruit is of little if any value. Many other differences are brought out in the characterization. Much of the material distributed from the Rocky Mountains belongs to this species. I may cite the following as at hand.

COLORADO: L. N. Goodding, 1456, Camp Creek, Routt Co., July 6, 1903; 1683, Willow Creek, Routt Co., July 25, 1903; Rydberg and Vreeland, 6030, La Veta, May 18, 1900; K. K. MacKenzie, 240, Breckenridge, Aug. 1901; C. F. Baker, 55, 139, and 380, Plants of West Central Colorado, 1901. WYOMING: By the writer, 2954, Evanston, May, 1897; 117, 6968, and 6985, Albany Co.; L. N. Goodding, 555, Elk Mt., Aug. 21, 1901; Merrell and Wilcox, 458, Point of Rocks, June 17, 1901. The following are allied, but when better known will probably be found to represent two other species: Baker's Plants of Nevada, nos. 946 and 1002; Mrs. R. W. Summers, specimens from Yamhill, Co., Oregon, March, 1903.

***Amelanchier elliptica*, n. sp.**—A low shrub or more rarely a small tree, growing mostly as scattered individuals rather than in clumps: branches and twigs rather slender and willow-like, gray except at the tips which are purplish-black with an inconspicuous beady resin:

most of the leaves elliptic in outline, incisely serrate, with rather small teeth extending to the middle or sometimes nearly to the base, nearly glabrous above from the beginning, lightly floccose woolly beneath when young as are also the slender petioles: inflorescence few-flowered, quite open in blossom and more so in fruit: calyx somewhat woolly-pubescent, its lobes deltoid-triangular, shorter than the tube, lanate on the inner face: petals narrowly oblanceolate, 12–15^{mm} long: mature fruit not known, the half-grown fruit spherical.

This will also have to be considered as a segregate from *A. alnifolia*, from which it differs noticeably in its elliptic leaves, the teeth of which are smaller and sharper and point toward the apex. The woolly pubescence of leaf and flower at once calls attention to this as distinct from the thick-leaved glabrous *A. alnifolia*. *A. elliptica* seems to be a species of wet places in the mountain parks and open stream banks. The species is again noticeable because of its few large flowers which are well exerted from the leaves. It is as handsome a species when compared with *A. alnifolia* as is *A. florida* when compared with *A. Cusickii*.

I take as the type L. N. Goodding's no. 1447, Beaver Creek, Larimer Co., Colo., July 4, 1903. The following also seem to belong here: Goodding, no. 1036, Milford, Utah, June 5, 1902; Baker, Earle, and Tracy, no. 197, Bob Creek, Colo., June 28, 1898; possibly the following also: Jones, no. 1447, City Creek canon, Utah, June 5, 1880; Baker's West Central Colorado Plants, 1901, nos. 47 and 260 (in my set distributed unnamed).

THE ROCKY MOUNTAIN HERBARIUM,
LARAMIE, WYOMING.